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TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371			U.S. APPLICATION NO. (If known, see 37 CFR 1.5) 10/070836
INTERNATIONAL APPLICATION NO. PCT/SE00/01798	INTERNATIONAL FILING DATES 15 September 2000	PRIORITY DATE CLAIMED 16 September 1999	
TITLE OF INVENTION METHOD FOR MANUFACTURING AND APPLICATION OF HEATING ELEMENT FOR HEATING IN A VEHICLE			
APPLICANT(S) FOR DO/EO/US Peter Öberg			

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

- ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
- ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing 35 U.S.C. 371
- ☒ This is an express request to begin national examination procedures (35 U.S.C. 371 (f)). The submission must include items (5), (6), (9) and (21) indicated below.
- ☒ The US has been elected by the expiration of 19 months from the priority date (PCT Article 31).
- ☒ A copy of the International Application as filed (35 U.S.C. 371 (c)(2))
 - ☐ is attached hereto (required only if not communicated by the International Bureau).
 - ☒ has been communicated by the International Bureau.
 - ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
- ☐ An English language translation of the International Application as filed (35 U.S.C. 371 (c)(2)).
 - ☐ is attached hereto.
 - ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
- ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
 - ☐ are attached hereto (required only if not communicated by the International Bureau).
 - ☐ have been communicated by the International Bureau.
 - ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - ☒ have not been made and will not be made.
- ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
- ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)). (unexecuted)
- ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 11 to 20 below concern document(s) or information included:

- ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98. w/PTO-1449, 3 references
- ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
- ☐ A FIRST preliminary amendment.
- ☐ A SECOND or SUBSEQUENT preliminary amendment.
- ☐ A substitute specification.
- ☐ A change of power of attorney and/or address letter.
- ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
- ☒ A second copy of the published international application under 35 U.S.C. 154(d)(4).
- ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
- ☒ Other items or information: Copy of International Preliminary Examination Report, Three (3) Sheets of Formal Drawings

TITLE

Method for manufacturing and application of heating element for heating in a vehicle

TECHNICAL FIELD

- 5 The present invention relates to a method for the production and application of a heating element for heating in vehicles, the heating element consisting of a heating wire defining at least one electric heating loop extending, in its operating position, in a predetermined pattern.

10 STATE OF THE ART

- It is previously known to produce heating elements for vehicles constructed from an electrically conducting heating loop that is applied onto a layer of material. Conventional heating elements are produced as separate products intended to allow rough handling, for example retrofitting into existing vehicle seats. The heating element
15 itself or the surrounding layers of material have had to function as a protective and carrying layer and have been given such a thickness that the heating elements have been noticeable to the user, due to stiffness as well as level differences in the seat around the edges of the element. Further, the increasing cost hunt on vehicle components has raised the demand for low manufacturing costs, with regard to material
20 as well as mounting costs.

- The object of the present invention is to provide a method for the production and application of a heating element for vehicles that solves the problems discussed above in such a way that for example vehicles can be equipped with heating elements at a very limited additional cost, enhancing the driving comfort.
25

DISCLOSURE OF INVENTION

- Said object is achieved by means of a method characterised by the steps of:
- 30 positioning the heating wire onto at least one side of a temporary carrier,
applying an adhesive over said carrier, at least over those areas where the heating wire is lying on the carrier, and over the heating wire, causing the heating wire to adhere to the surface of the carrier,
transporting the carrier with the heating wire to a final substrate, which the heating element is to be in close contact with,

pressing the heating wire against the substrate, heating the adhesive so as to make the wire adhere to the substrate, and

removing the carrier, so that the heating wire is released from the carrier and adheres to the substrate, to form the heating element for heating in the vehicle.

5

DESCRIPTION OF DRAWINGS

The invention will be described in further detail below, by way of an embodiment example, with reference to the enclosed drawings, of which

Fig. 1 is a top view, schematically illustrating the construction of one example of a heating element for use with the method according to the invention,

Fig. 2 shows a partially broken section, in an enlarged scale, of the heating element during a manufacturing stage,

Figs. 3-5 shows the corresponding section during an application stage, and

Fig. 6 is a cross-section through a vehicle seat with a heating element during the manufacturing process for the complete seat.

10 PREFERRED EMBODIMENT

The basic thought of the present invention is to provide a heating element with as simple a construction as possible, and to limit the handling stages and handling times of the element before fitting it into its final location, e.g. in a vehicle seat. Through this, the demands for easy handling of the mechanical construction of the element before fitting can be lowered, thus reducing the additional cost of providing a vehicle with heating elements. The heating element is thus intended for heating in a vehicle, the power source commonly being the vehicle generator and battery. The heating element is generally intended for heating a vehicle seat, for example its bottom, backrest or headrest, in order not to chill the vehicle driver or passenger.

15 The heating element can also be arranged at other locations in the vehicle passenger compartment, for example in armrests panels, floor, door panels and roof, in order to maintain a warm and comfortable environment.

20

The active component of the heating element is a heating wire 1, normally consisting of metal or carbon fibre, or being spun from filaments with different properties.

25 The heating wire 1 is of the electrical resistance wire type, that is, a wire developing heat due to its high resistance when passed by an electric current, said current in

turn being obtained through two feeder lines 2, 3 that may or may not be insulated, connected to a (not shown) electric power source and, in a handling stage to be described in further detail below, applied through gluing onto a flexible carrier 4, as hinted by dot-dashed lines in Fig. 1. The carrier may be paper or a plastic film, and, preferably, as such electrically non-conductive.

The resistance wire is made with an appropriately adapted resistance for generating heat during application of a voltage across the terminal ends 5, 6 of the wire through the feeder lines 2, 3. The resistance is chosen by selecting the values of various parameters, such as the wire material resistivity, the wire diameter and its length. The wire may be uninsulated, or insulated with a conventional insulating material. The method according to the invention will now be described, with reference to Figs. 2, 3, 4, 5 and 6. The carrier 4 mentioned above, during rational production, is produced as a continuous web, uncoiled from a not shown roll and conveyed through a plant for producing heating elements. The transportation medium may consist of a not shown conveyor in the form of an endless conveyor belt, supporting the carrier and feeding it, either step-wise or continuously, through various stations in the manufacturing process. Initially, the heating wire 1 is applied, likewise being uncoiled from a not shown roll and applied into its predetermined pattern to form the active component of the heating element. The positioning is e.g. made by winding the wire around a number of fixed nails or pins defining a positioning fixture for the wire. This could be made either manually, or automatically by means of a robot. The "small" sinus shape, i.e. the serpentine shape superimposed upon the major serpentine shape, is preferably selected for absorbing the load from e.g. a person in a vehicle seat and allow stretching of the heating wire. This smaller sinus shape is preferably preformed in an earlier stage. Another serpentine shape is of course conceivable. As can be gathered from Fig. 2, the wire is positioned practically in contact with the carrier 4.

Fig. 2 hereby illustrates a schematic cross-section through the carrier and thus cross-sections through some loop portions of the heating wire 1. At a station 21 for application of adhesive, shown in Fig. 2, the chemical bonding agent is applied, preferably in the form of a spray glue, through spraying of preferably the entire carrier surface, more specifically the topside 7 thereof, or at least those portions of the

carrier where the heating wire 1 extends. The spray glue 8 is supplied from a number of not shown nozzles above the carrier and the heating wire. Through the carrier 4 advantageously having certain absorbing properties, the spray glue will penetrate almost entirely into the carrier material, and thus will not form any strongly adhesive surface coating upon the carrier. On the other hand, an adhesive layer 9 or glue layer will be applied onto the heating wire 1, over its entire length on the carrier 4. The glue is of the thermo-glue type, whereby the glue in the nozzles and during application onto the heating wire is kept heated to a temperature above the glue melting temperature, entailing that the glue will be in liquid form or at least have adhesive properties. In practice, the glue outside of the nozzles will transform into filaments, settling like a "spun" surface across the heating wire 1 and the topside 7 of the carrier 4. Either the entire topside, or selected areas along the wire loop can be coated. The glue is applied in such a quantity that it will settle also in an area 10, 11 between the heating wire 1 and the carrier 4 on both sides of the wire, and will practically flow in under the wire. Hereby, the adhesive or glue will provide an attachment between the heating wire 1 and the carrier. As the carrier with the heating wire is subsequently conveyed to an area with a temperature below the melting point of the glue, in the case of thermo-glue, the glue will harden and form an efficient attachment of the heating wire 1 in its determined position or distribution relative to the carrier 4.

After a completed application and attachment of the heating wire to the carrier 4 in the manner described above, the carrier 4 may, at the final end of the machine, be wound up into a roll for further transportation e.g. to the subsequent intermediate user or end user. As an alternative, the carrier and heating wire could be cut transversally into predetermined units, e.g. into the rectangular shape indicated by a dot-dashed line in Fig. 1. The heating wire may thereby have such an extension as to run continuously across from one carrier unit to another for a rational production, and the wire would then be cut in the same step as the transversal cutting of the carrier 4. The web material would then either have the same width as the final width of the carrier, or two or more carriers might be arranged side by side, whereby longitudinal cutting would also be performed at a suitable stage. The carrier 4 is, however, according to the invention, only a temporary carrier or transportation carrier, intended for upholding the shape and location of the heating wire 1 and enable its

handling before being given its final location in an intermediate product or an end product.

Fig. 3 illustrates a later stage in the handling of the heating element according to the method of the invention. This stage may be a later stage in a continuous process in one and the same machine described above, but may also be a handling stage at an intermediate user's or an end user's. Common for the different cases is that the heating element is to be placed onto a substrate 13, defining some kind of a covering layer inside a vehicle, preferably in a vehicle passenger compartment. This substrate 13 could be a textile upholstery layer defining the upholstery of a vehicle seat. The upholstery layer may hereby for example be provided with the heating element already at an upholstery manufacturer, who will supply the upholstery layer equipped with a heating element. Alternatively, the heating element may be applied to the upholstery layer in connection with the production of a vehicle seat, to be described further below. With the term substrate is meant a base surface, not necessarily located below the heating element but just as well a side surface or a surface turned downwards, such as a ceiling.

The carrier thus functions as a temporary carrier for storage and transportation of the heating element and for application of the heating element onto the substrate. By substrates turned upwards, such as in Fig. 3, the carrier is positioned upside down in relation to the stage according to Fig. 2, the heating wire being located on the bottom side of the carrier. The carrier is either handled unit-wise, for example manually, by being positioned, with the heating wire 1 turned downwards, against the substrate 13, that is, the topside 14 thereof. The carrier with the heating wire is advantageously applied to the substrate 13 using a certain pressure, e.g. with weights. The adhesion of the heating wire 1 will take place by heating the heating wire 1 as well as the substrate 13 to a temperature above the melting temperature of the thermo-glue, entailing that the thermo-glue will melt so as to be activated into adhesion, affixing the heating wire to the substrate. The heating is obtained by the heating wire 1 already at this stage advantageously being connected to the feeder lines 2, 3, which in turn are connected to a connector means 23 (see Fig. 1). Via the connector means, the heating element is connected to an electric power source, causing an electric current to flow through the heating wire. Said current is of such

strength as to cause the heating described above. As illustrated schematically in Fig. 4, the heating and the melting of the glue entails, that the glue surface at the heating wire 1 is parted, reducing the adhesion of the carrier 4 to the wire. The melting of the glue thus entails that the carrier 4, after removal of the weights, can be lifted off, separating the heating wire 1 from the carrier and leaving it on the substrate. The current supply is then interrupted, e.g. through disconnecting the connector means 23 from the voltage source, whereupon the heating wire will cool down to a temperature below the melting temperature of the glue. This leads to the glue achieving full adhesive action against the topside 14 of the substrate 13.

It may be gathered from Fig. 4, that the glue on the envelope surface of the heating wire is substantially missing over that portion of its circumference where it is least needed, that is at the portion of the circumference directed away from the substrate 13. This may however be more or less evident. This entails that, at a stage after the described application stage, the transport carrier 4 can be removed, preferably starting from one edge 15 of the carrier, by lifting it off the wire and the substrate. The heating wire thereby remains on the substrate and the carrier can be removed completely, see Fig. 5. The glue will then be concentrated onto exactly those portions where it is to function as an adhesive, i.e. between the heating wire 1 and the substrate 13.

The manufacture of a vehicle seat with a heating element will now be described by way of an example, with reference to Fig. 6. The method according to the invention can be used by that type of vehicle seat manufacture where the filling or core forming the resilient comfort-providing carrier for the upholstery material is not formed before applying of the upholstery onto the finished core, but is formed by means of filling expanding cold foam, e.g. polyurethane foam, into a mould 16, to form the comfort-providing, resilient core 17.

The upholstery material 13 is initially placed into the mould 16 with its outside, made e.g. of a textile layer 18, turned towards the wall 19 of the mould. The upholstery material may, besides the textile material, comprise an internal layer 20 of e.g. polyurethane film, fixedly applied directly onto the fabric layer or onto an intermediate foam material. The upholstery material 13 is produced and finished in an earlier

stage, through for example flame lamination or gluing. The heating element according to the invention may, in a previous stage, e.g. by a supplier of upholstery material, be applied to the inside of the upholstery material, that is against its internal layer 20, or may be placed into the mould 16 against the upholstery material in a separate stage.

If the heating element has not been applied before, the transfer and adhesion of the heating element, i.e. the heating wire, is performed in the manner described above, the upholstery material thus defining the substrate 13. In the illustrated example, the layer 20 and the glue may be of the same material, e.g. polyamide, polyurethane, or similar. Hereby, the heating loop is affixed to the upholstery material 14.

The heating element is then completely oriented and affixed in relation to the upholstery material, whereupon the core 13 is created through filling of the cold foam 13, the foam then expanding in a fermentation process and entirely filling the interior of the mould and being connected to the inner layer 9 of the upholstery material, said layer also being of the same material as the foam material, i.e. polyurethane. The layer 9 furthermore prevents the expanding foam from penetrating into and through the upholstery material.

The vehicle seat in question or, more specifically, one part thereof, is thus substantially ready after cutting it clean and applying a backside layer, if any. It is not shown in the figure, but already in connection with its application, the heating element will be provided with the feeder lines, extending between the upholstery material and the core, as well as with said electrical connector means for connection to a not shown control unit for control of the power supplied from the vehicle voltage source.

The invention will not be limited to the embodiments described above and illustrated in the drawings, but can be varied within the scope of the appended claims. It will be understood that the heating wire is in close contact with the temporary carrier 4 as well as the upholstery and the core even if, for the sake of clarity, the various components are shown with intermediate distances. As mentioned above, the heating element can be fitted to other substrates in the vehicle, e.g. panels, roof, instrument

panel, etc. When fitting in vehicle seats, other methods than the one described for seats could be used.

CLAIMS

1. A method for production and application of heating elements for heating in vehicles, said heating element consisting of a heating wire (1) defining at least one electric heating loop extending, in its operating position, in a predetermined pattern, characterised by the steps of:
- 5 positioning the heating wire (1) onto at least one side (7) of a temporary carrier (4),
- 10 applying an adhesive (8) over said carrier, at least over those areas where the heating wire is lying on the carrier, and over the heating wire, causing the heating wire to adhere to the surface of the carrier,
- 15 transporting the carrier (4) with the heating wire to a final substrate, which the heating element is to be in close contact with,
- pressing the heating wire against the substrate, heating the adhesive so as to make the wire adhere to the substrate, and
- 20 removing the carrier, so that the heating wire is released from the carrier and adheres to the substrate, to form the heating element for heating in the vehicle.
2. The method according to claim 1, characterised by the adhesive being applied through spraying across the heating wire and the carrier surface on that side thereof where the heating wire (1) is located.
- 25
3. The method according to claim 2, characterised by the carrier absorbing the adhesive (8) so that the carrier surface (7) will only obtain negligible adhesive ability.
- 30
4. The method according to claim 1 wherein the adhesive is a thermo-glue, characterised by the thermo-glue being heated and maintained at a temperature above the melting point of the thermo-glue when the thermo-glue is

applied onto the heating wire (1) and the carrier (4) as well as when the wires have been applied onto the substrate (13).

5 5. The method according to claim 4, characterised by said heating being obtained through the supply of electric current through the heating wire (1).

10 6. The method according to claim 5, characterised by the supply of electric current being achieved through connecting the heating wire (1) to an electric power source via one or more electrical connector means (31), intended for connection of the heating element to the vehicle voltage source when in the final operating position in the vehicle.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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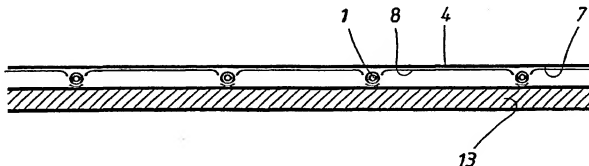
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- (74) Agents: ANDERSSON, Per et al.; Albihns Patentbyrå Göteborg AB, P.O. Box 142, S-401 22 Göteborg (SE).
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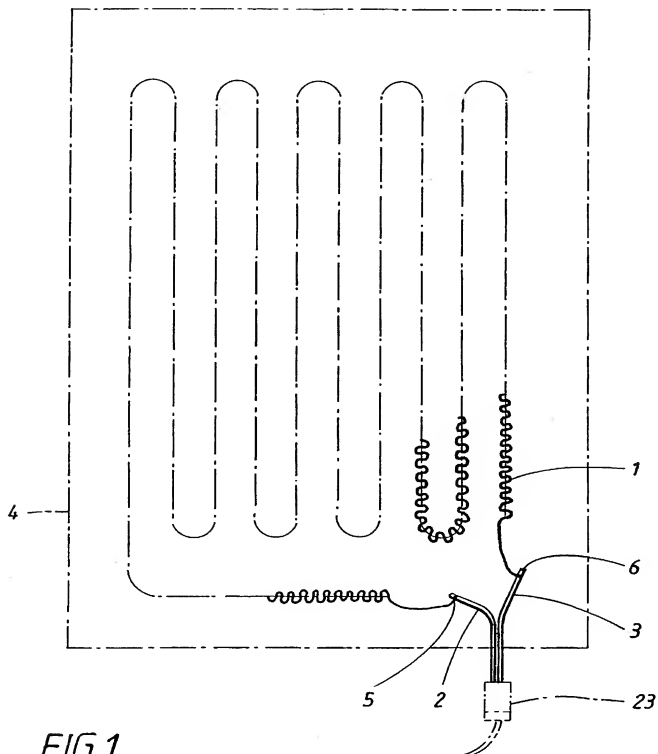
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

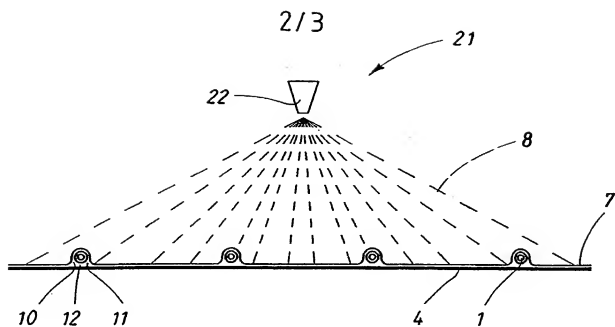
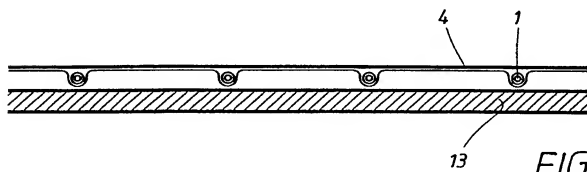
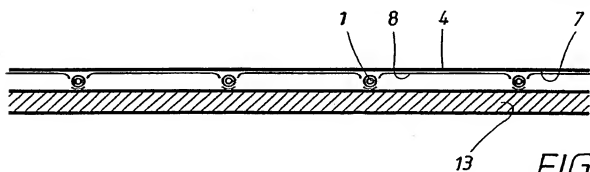
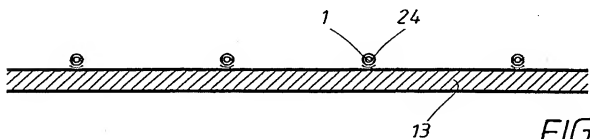
(54) Title: METHOD FOR MANUFACTURING AND APPLICATION OF HEATING ELEMENT FOR HEATING IN A VEHICLE



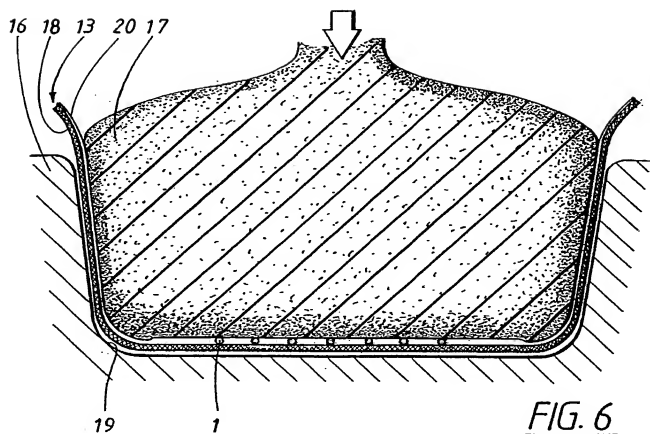
(57) Abstract: A method for production and application of heating elements for heating in vehicles is described. The heating element consists of a heating wire (1) defining at least one electric heating loop extending, in its operating position, in a predetermined pattern. The heating wire (1) is positioned onto one side (7) of a temporary carrier (4). An adhesive (8) is applied over said carrier, and over the heating wire, causing the heating wire to adhere to the surface of the carrier. The carrier with the heating wire is then transported to a final substrate (13), which the heating element is to be in close contact with. The heating wire is pressed against the substrate, and the adhesive is activated so as to make the wire adhere to the substrate. The carrier is removed, so that the heating wire is released from the carrier and adheres to the substrate, to form the heating element for heating in the vehicle.

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FIG.1

FIG. 2FIG. 3FIG. 4FIG. 5

3/3



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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

☐ Declaration
Submitted
with Initial
Filing

OR

☒ Declaration
Submitted after Initial
Filing (surcharge
(37 CFR 1.16 (e))
required)

Attorney Docket Number ALBIHN-426

First Named Inventor Peter Öberg

COMPLETE IF KNOWN

Application Number Not Yet Assigned

Filing Date

Group Art Unit N/A

Examiner Name Not Yet Assigned

As a below named inventor, I hereby declare that:

My residence, mailing address, and citizenship are as stated below next to my name.

I believe I am the original and first inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled:

METHOD FOR MANUFACTURING AND APPLICATION OF HEATING ELEMENT FOR
HEATING IN A VEHICLE

(Title of the Invention)

the specification of which

☐ is attached hereto

OR

☒ was filed on (MM/DD/YYYY) 09/15/2000 as United States Application Number or PCT International

Application No. PCT/SE00/01798 and was amended on (MM/DD/YYYY) (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT International filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365 (a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES	NO
9903324-3	SE	09/16/1999	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

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DECLARATION — Utility or Design Patent Application

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NAME OF SOLE OR FIRST INVENTOR:



A petition has been filed for this unsigned inventor

Given Name
(first and middle (if any))

Peter

Family Name
or Surname

Öberg

Inventor's
Signature

Sandhem

Date

Residence: City

State

Country

Sweden

Citizenship

Sweden

Mailing
Address:

Skolvägen 21

City

Sandhem

State

ZIP

S-560 42

Country

Sweden

NAME OF SECOND INVENTOR:



A petition has been filed for this unsigned inventor

Given Name
(first and middle (if any))Family Name
or SurnameInventor's
Signature

Date

Residence: City

State

Country

Citizenship

Mailing
Address:

City

State

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Country



Additional inventors are being named on the

supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.

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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63) <input type="checkbox"/> Declaration Submitted with Initial Filing <input checked="" type="checkbox"/> Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)	Attorney Docket Number ALBITNW 3.3-426
	First Named Inventor Peter Öberg
	COMPLETE IF KNOWN
	Application Number
	Filing Date
	Group Art Unit
	Examiner Name

As a below named inventor, I hereby declare that:

My residence, mailing address, and citizenship are as stated below next to my name.

I believe I am the original and first inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Method for manufacturing and application of heating in a vehicle.

(Title of the invention)

the specification of which

☐ is attached hereto

OR

☒ was filed on (MM/DD/YYYY) 09/15/2000 as United States Application Number or PCT International Application No. PCT/SE00/01798 and was amended on (MM/DD/YYYY) (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT International filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365 (a) of any PCT International application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or of any PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
9903324-3	Sweden	09/16/1999	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB02B attached hereto.

Please type a plus sign (+) inside this box



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DECLARATION — Utility or Design Patent Application

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith: Customer Number 000530

Direct all correspondence to: ☒ Customer Number or Bar Code Label



OR ☐ Correspondence address below

Name

Address

City

State

ZIP

Country

Telephone

Fax

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAME OF SOLE OR FIRST INVENTOR:

☐ A petition has been filed for this unsigned inventor

Given Name (first and middle if any) 1-00 Peter

Family Name or Surname Öberg

Inventor's Signature

Date

December 10, 2002

Residence: City Sandhem

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Mailing Address:

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State

ZIP

S-560 42

Country

Sweden

NAME OF SECOND INVENTOR:

☐ A petition has been filed for this unsigned inventor

Given Name (first and middle if any)

Family Name or Surname

Inventor's Signature

Date

Residence: City

State

Country

Citizenship

Mailing Address:

City

State

ZIP

Country

☒ Additional inventors are being named on the 1 supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.